

09/832,530.

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PATENT, TRADEMARK,  
 COPYRIGHT AND RELATED  
 INTELLECTUAL PROPERTY LAW



February 8, 2005

Mail Stop Certificate of Corrections Branch  
 Commissioner for Patents  
 P.O. Box 1450  
 Alexandria, VA 22313-1450

Re: U.S. Patent No.: 6,832,826 B2  
 Issued: December 21, 2004  
 Inventor: Dunand  
 Our Docket: 33441

**Certificate**  
**FEB 16 2005**  
**of Correction**

Sir:

A Certificate of Correction under 35 U.S.C. 254 is hereby requested to correct Patent Office printing errors in the above-identified patent. Enclosed herewith is a proposed Certificate of Correction (Form No. PTO-1050) for consideration along with appropriate documentation supporting the request for correction.

It is requested that the Certificate of Correction be completed and mailed at an early date to the undersigned attorney of record. The proposed corrections are obvious ones and do not in any way change the sense of the application.

We understand that a check is not required since the errors were on the part of the Patent and Trademark Office in printing the patent.

Very truly yours,

  
 Jeffrey J. Sopko, Reg. No. 27676

JJS:vlm  
 Enclosures

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Mail Stop Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date indicated below.

Jeffrey J. Sopko

Name of Attorney for Applicant(s)

February 8, 2005

Date

Signature of Attorney

FEB 17 2005

**UNITED STATES PATENT AND TRADEMARK OFFICE  
CERTIFICATE OF CORRECTION**

PATENT NO. : 6,832,826 B2  
DATED : December 21, 2004  
INVENTOR(S) : Dunand

PAGE 1 OF 2

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 7

Line 1, after "acoustic wave generator", please insert --14--.

Column 7

Line 22, after "acoustic wave generator", please insert --14--.

Column 14

Claim 4, line 42, after "measurement", please delete "1" and insert therefor -- $\ell$ --.

Column 14

Claim 4, line 44, please delete " $1/4$ " and insert therefor --[[ $1/4$ ]]  $\ell/4$ --.

Column 14

Claim 4, line 45, please delete " $1/2$ " and insert therefor -- $\ell/2$ --.

Column 14

Claim 4, line 45, please delete " $3/4$ " and insert therefor --3  $\ell/4$ --.

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PATENT NO. 6,832,826 B2

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**FEB 17 2005**

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CERTIFICATE OF CORRECTION**

PATENT NO. : 6,832,826 B2  
DATED : December 21, 2004  
INVENTOR(S) : Dunand

PAGE 2 OF 2

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 14

Claim 5, line 48, please delete "1/2" and insert therefor -- $\ell/2$ --.

Column 14

Claim 5, line 48, please delete "3/4" and insert therefor --3  $\ell/4$ --.

Column 14

Claim 6, line 52, please delete "1/2" and insert therefor --[[1/2]]  $\ell/2$ --.

Column 14

Claim 8, line 63, please delete "1/2" and insert therefor -- $\ell/2$ --.

Column 15

Claim 14, line 24, before "The printer" please delete "Printer".

MAILING ADDRESS OF SENDER:

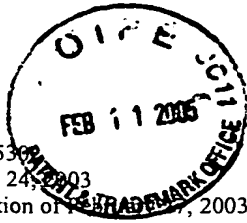
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PATENT NO. 6,832,826 B2

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**FEB 17 2005**



1           The two feed apertures 11 are located symmetrically  
2           relative to a central plane of cavity 6 perpendicular to  
3           the plane of the jets, and immediately below upper  
4           surfaces 107, 108 of the cavity. Ink outlet aperture 12  
5           is located in a housing 13 of ~~shaker~~ acoustic wave  
6           generator 14. The ink supplied via apertures 11 is  
7           intended to keep the cavity 6 filled and under pressure  
8           while the ink leaves via the nozzles 36. The ink outlet  
9           aperture 12 is used during startup, shutdown and  
10          hydraulic maintenance phases of the print head. The  
11          relative disposition and cross-sections of ink inlet  
12          aperture 11 and ink outlet aperture 12 are optimized to  
13          ensure uniform distribution of the ink to the nozzles, so  
14          as to ensure that the ink in the cavity is not disturbed  
15          by the ink-flow pulsations coming from the ink circuit,  
16          to ensure that the ink in the cavity is replaced rapidly  
17          (drainage), and to eliminate any air bubbles in the  
18          cavity by ensuring that there is a high flow-rate of  
19          liquid during hydraulic maintenance sequences. The body  
20          also contains housings 13 each provided for an acoustic  
21          wave generator 14 already known per se that has the basic  
22          shape of a cylinder 15 ending in a surface 16 that is  
23          parallel to the plane of the nozzles, said surface 16

1 constituting the vibrating surface of the acoustic wave  
2 generator 14. The section of the housing 13 of the  
3 acoustic wave generator 14 closest to the cavity has the  
4 shape of a cylinder 17.

5 In figures 2 and 4 the acoustic wave generator 14 is  
6 shown in dotted lines, firstly in a position close to its  
7 assembled position, and secondly once in its assembled  
8 position. In the assembled position the contour of the  
9 acoustic wave generator 14 is practically identical in  
10 figures 2 and 4 with that of the housing of the generator  
11 14. In the drawings, particularly figures 2 and 4, the  
12 housing of the acoustic wave generator 14 is located  
13 above cavity 6. This "above" position is in no way  
14 compulsory in practice. However, the terms "above" and  
15 "below" are used as a convenient spatial reference to  
16 describe the position of components relative to one  
17 another. In the example shown, the cylinder of the  
18 acoustic wave generator 14 is of diameter  $l/2$ , i.e. half  
19 the length of cavity 6 and its axis lies both in the  
20 plane of the jets and equidistant between the ends of  
21 cavity 6. In operation, the vibrating surface 16 of  
22 generator 14 is located level with the upper section of  
23 the cavity 6. This arrangement is in no way compulsory

1       and this surface may be disposed slightly higher in the  
2       housing 13 of the acoustic wave generator 14. Given the  
3       shape of the acoustic chamber and the shape of the  
4       housing of generator 14, in order for the acoustic waves  
5       to be transmitted efficiently and in a preferred  
6       vibration mode through the ink in cavity 6, it is  
7       necessary to provide a connection 18 between housing 13  
8       of acoustic wave generator 14 and cavity 6. This  
9       connection 18, which consists of a hollow in the ~~flat~~  
10      ~~walls~~ segments 7, 8, will now be described.

11           It should first be noted that in terms of the width  
12      of cavity 6 the connection is provided by the  
13      continuation of the cylindrical surface of housing 13 of  
14      acoustic wave generator 14. This point will be explained  
15      in greater detail below with reference to figure 5A.

16           Figure 5A shows the shape of the cross-section of  
17      cavity 6 as a plane parallel to the plate 39 carrying the  
18      nozzles 36. The projection on the cross-section plane of  
19      cylinder 17 forming the housing of acoustic wave  
20      generator 14 is also shown in dotted lines on a section  
21      outside cavity 6 and in unbroken lines inside cavity 6.  
22      The centre of the circle representing this projection is  
23      located on the longitudinal axial line of cavity 6



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Amdt. Dated July 28, 2004  
Reply to Office action of April 29, 2004

19 generator body connected to be leaktight to the generator body, each cavity having an  
20 ink feed, each cavity being defined particularly by [[a]] the nozzle plate and a wall, the  
21 intersection of the wall and the nozzle plate defining a first plane contour line of the  
22 wall, the nozzle plate comprising a plurality of nozzles aligned along an axial direction  
23 of the nozzles perpendicular to the axial direction of the jets, the axial direction of the  
24 jets and the axial direction of the nozzles defining a plane of the jets,

25 - a generator characterized in that the wall of each resonance cavity is  
26 perpendicular to said nozzle plate, the first contour line being formed by two equal  
27 segments that are parallel to one another and the axial direction of the nozzles, each  
28 segment having two ends: a first and a second end, the two first ends of each segment  
29 being connected by a first curved line and the two second ends of each segment being  
30 connected by a second curved line.

1 Claim 2 (currently amended) ~~Generator~~ The generator of claim 1 characterized  
2 in that each curved line is concave towards the inside of the cavity.

1 Claim 3 (currently amended) ~~Generator~~ The generator of claim 2 characterized  
2 in that the first and second curved lines are constituted by semicircles the diameter of  
3 which is the space between the two equal segments.

1 Claim 4 (currently amended) ~~Generator~~ The generator of claim 1 characterized  
2 in that the largest measurement  $\varnothing$  of the first contour of the cavity lies along the axial

3 direction of the nozzles, the distance between the two segments being approximately  
4  $[[1/4]] \frac{1}{4}$  and the height of the wall being between  $\frac{1}{2}$  and  $3\frac{1}{4}$   $\frac{1}{2}$  and  $3\frac{1}{4}$ .

1 Claim 5 (currently amended) ~~Drop generator~~ The generator of claim 4  
2 characterized in that the acoustic-wave generator has a circular, transverse cross-  
3 section the diameter of which is between  $\frac{1}{2}$  and  $3\frac{1}{4}$   $\frac{1}{2}$  and  $3\frac{1}{4}$ .

1 Claim 6 (currently amended) ~~Generator~~ The generator of claim 5  
2 characterized in that one part of the acoustic-wave generator housing has an opening  
3 having a cross-section the length of which is more or less equal to  $[[1/2]] \frac{1}{2}$ .

1 Claim 7 (Canceled)

1 Claim 8 (currently amended) ~~Generator~~ The generator of claim  $[[7]]$  1  
2 characterized in that for the sections of the connector surface located in the cavity the  
3 intersections of the connector surface with the planes parallel to the nozzle plate  
4 comprise two curves symmetrical to one another relative to the jet plane, the ends of  
5 each of these curves being separated from each other by the distance between the  
6 segments of the first contour.

1 Claim 9 (currently amended) ~~Generator~~ The generator of claim  $[[7]]$  1  
2 characterized in that the connector surface forms an opening between the acoustic-

issued as claim 8



3 wave generator housing and the cavity, said opening having a cross-section the length  
4 of which is more or less equal to  $\ell/2$ .

5 Claim 10 (currently amended) ~~Generator~~ The generator of claim [[7]] 1  
6 characterized in that at least part of the connector surface is formed by two sections of  
7 conical surface that are symmetrical to each other relative to the jet plane.

1 Claim 11 (currently amended) ~~Generator~~ The generator of claim 1  
2 characterized in that one of the ink-feed apertures is located at one end and the other  
3 at a second end of a segment of the cavity, and an ink outlet opening in the body  
4 housing is located at a top of the cavity.

1 Claim 12 (currently amended) ~~Generator~~ The generator of claim 1  
2 characterized in that the nozzles of the cavity are equidistant and that the distance  
3 between an end nozzle and of an end cavity of the body and a section of the external  
4 wall of the body located at the intersection of said wall with the jet plane is shorter  
5 than half the distance between two consecutive nozzles of the nozzle plate.

1 Claim 13 (currently amended) ~~Generator~~ The generator of claim 1 1  
2 characterized in that the distance between two end nozzles and two consecutive  
3 cavities of the same body is equal to the distance between two consecutive nozzles of  
4 the same cavity.

1                    Claim 14 (currently amended) ~~Generator~~ The generator of claim 13  
2                    characterized in that ~~[[it]]~~ the generator is equipped with positioning means aligned  
3                    parallel to the axial direction of the nozzles.

1                    Claim 15 (currently amended) ~~Print~~ A print head characterized in that ~~[[it]]~~ the  
2                    print head comprises an ink generator of claim 12 and a multijet deflector assembly,  
3                    said assembly comprising charge and deflector electrodes to charge and deflect or not  
4                    deflect the drops from each jet.

1                    Claim 16 (currently amended) ~~Inkjet~~ An inkjet printer characterized in that  
2                    ~~[[it]]~~ the printer is equipped with a plurality of ink-drop generators of claim 12, the  
3                    generators being aligned side-by-side such that the distance between an inkjet of an  
4                    end nozzle of a generator and the closest nozzle of a connected ink generator is equal  
5                    to the distance between consecutive jets of the same generator.

1                    Claim 17 issued as claim 14 (currently amended) ~~Printer~~ The printer of claim 16 characterized in  
2                    that ~~[[it]]~~ the printer comprises a pressurized ink distributor that supplies the various  
3                    generators with ink via pipes and in that the lengths of said pipes are equal between a  
4                    distributor outlet and an ink inlet of each generator.